

Editorial / Call for Papers: Land Use in LCA (Subject Editor: Llorenç Milà i Canals)

Land Use in LCA: A New Subject Area and Call for Papers

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The Need for a New Subject Area 'Land use in LCA'

Land use by humans is the primary direct cause of many impacts from production systems. There is wide consensus that land use is the main cause of biodiversity degradation, and inappropriate land management is a main driver for the reduction in the biological production capacity of soil. Emissions caused by land use changes in the last two centuries have caused a change in the Earth's radiative forcing of the same order of magnitude as emissions from burning fossil fuels. It is thus not surprising that ways to account for land use impacts in LCA have been explored since the early methodological guides for this tool. However, there is to date no consensus as to how land use impacts may be incorporated in LCA. As noted in the synthesis of a recent workshop on land use impacts in LCA [1], "accounting for land use in LCA is inherently problematic [because] land represents a scarce resource, yet it is not simply consumed like mineral or fossil energy reserves, in the sense that it is not extracted and dissipated". Accounting for the use of the flow 'land' by adding up the m²-year used in different stages of the life cycle is a good first step, but not enough. It is indeed the change in land quality that needs to be assessed, and this change obviously depends on how land is managed.

There exist many good tools for the assessment of land use impacts in specific life cycle stages or sectors, which use appropriate and detailed indicator sets. However, there is a conflict between the level of detail and the life cycle coverage that can be attained. In general, it may be noted that LCA is not an appropriate tool to guide land management: it will be most valuable in comparing systems which differ quite substantially (e.g. bio-based/fossil-based products), but it should also be able to highlight substantive differences in land quality measures caused by different management systems (e.g. organic vs. conventional agriculture) [1].

Concern for the inclusion of land use impacts in LCA has led to many publications in recent years, as well as the work of SETAC working groups [2,3] and, more recently, one of the task forces within the UNEP/SETAC Life Cycle Initiative [4]. These publications have provided a basis for further methodological development.

Call for Papers

The Publisher-Editor and the Subject Editor invite submissions in the area of Land Use in LCA. Such articles could include, though are not limited to:

- Assessment of land use from a product life cycle perspective, in order to gain more insights into the relative importance of different life cycle stages in the overall amount of land used (inventory indicators)
- Research into inventory modelling for land use in consequential and attributional LCA
- Methodology development, particularly to account for land transformations and bio-geographical differentiation over the life cycle
- Development of operational indicators which are meaningful over the entire life cycle of a product
- Discussion of midpoint vs. damage indicators, and thresholds for these indicators
- Case studies, particularly in sectors using land extensively and/or comparing bio-based vs. fossil-based products or land-based vs. sea-based products
- Communication of land use impacts alongside traditional LCA impact categories
- Reviews and evaluations of existing methods to account for land use impacts in LCA
- Definition of 'dose-response' functions for land use interventions and significant region-dependent land degradation processes; aggregation of different land use impacts along the life cycle
- Links between land use and existing impact pathways (e.g. soil C storage/release; effects on toxic emissions from reduced/enhanced soil filter capacity; etc.)

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